In re Patent Application of:
JIANG ET AL.
Serial No. **10/651,140**
Filed: **AUGUST 30, 2000**

IN THE CLAIMS

1. (Currently Amended) A fiber optic module slideable into and out of a cage with a slot, which is mounted on a host printed circuit board of a system chassis, for transmitting and/or receiving data, the fiber optic module comprising:

a printed circuit board~~, the printed circuit board~~ having high frequency electrical components mounted to a first surface, a pluggable electrical connector extending therefrom for insertion and removal from a corresponding electrical connector on the host printed circuit board, and a first ground plane formed on the first surface near a first edge;

a plurality of fiber optic receptacles, the plurality of fiber optic receptacles coupled to the printed circuit board in parallel; and

an electromagnetic interference shield~~, the electromagnetic interference shield~~ coupled to the first ground plane of the printed circuit board, thereby covering ~~such that it covers~~ the high frequency electrical components mounted to the first surface, and thereby forming ~~forms~~ a first guide rail out of ~~near~~ the first edge of the printed circuit board;

wherein the first guide rail is for sliding along the cage slot during insertion and removal of the pluggable electrical connector into and from the corresponding

electrical connector, and for shunting electromagnetic fields from the electromagnetic interference shield, through the first guide rail and the cage slot to a ground of the system chassis.

2. (Canceled)

3. (Previously Presented) The fiber optic module of claim 1, further comprising:

an optical block, the optical block having a plurality of lenses, each of the plurality of lenses for coupling photons between a plurality of fiber optic cables coupled to the plurality of fiber optic receptacles and the fiber optic module.

4. (Previously Presented) The fiber optic module of claim 3, wherein the optical block has a plurality of optical ports each having a fiber ferule inserted therein for aligning the fiber optic cables to the plurality of lenses of the optical block.

5. (Previously Presented) The fiber optic module of claim 3, wherein the optical block has a plurality of openings, each of the plurality of openings facing each of the respective plurality of lenses on a second side, each of the plurality of

openings having sufficient size to accept a transmitter or a receiver.

6. (Withdrawn) The fiber optic module of claim 5, further comprising:

a plurality of transmitters coupled into the plurality of openings in the optical block, each of the plurality of transmitters including a vertical cavity surface emitting laser.

7. (Previously Presented) The fiber optic module of claim 5 further comprising:

a plurality of receivers coupled into the plurality of openings in the optical block, each of the plurality of receivers including a photodiode.

8. (Canceled)

9. (Previously Presented) The fiber optic module of claim 1, wherein the electromagnetic interference shield couples to the ground plane of the printed circuit board such that it covers the high frequency electrical components mounted to the first surface and forms a second guide rail near a second edge of the printed circuit board.

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10. (Currently Amended) The fiber optic module of claim 9, wherein the electromagnetic interference shield sandwiches the printed circuit board; and wherein the first guide rail and the second guide rail extend outside the electromagnetic interference shield on opposites sides of the fiber optic module.

11. (Previously Presented) The fiber optic module of claim 1 further comprising:

a processor coupled to the printed circuit board, the processor to control the transmitting, the receiving, or both the transmitting and receiving of data through at least one of the plurality of fiber optic receptacles.

12. (Previously Presented) The fiber optic module of claim 1, further comprising:

the plurality of fiber optic receptacles is at least four fiber optic receptacles; and,

the printed circuit board has a hot-pluggable connector to couple an electrical signal between the printed circuit board and an electrical device located off of the printed circuit board.

13. (Previously Presented) The fiber optic module of Claim 12, wherein the fiber optic receptacles are LC receptacles.

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14. (Canceled)

15. (Original) The fiber optic module of claim 1, wherein the printed circuit board has an electrical component to convert signals between an electrical form and an optical form.

16.-18. (Canceled)

19. (Currently Amended) A fiber optic system for transmitting and/or receiving data, comprising:

a fiber optic module~~, the fiber optic module~~ having one or more guide rails extending therefrom electrically coupled to a ground plane of a printed circuit board and electrically coupled to an electromagnetic shield surrounding high frequency electrical components mounted to the printed circuit board, the fiber optic module further having a plurality of fiber optic receptacles at one end and one or more pluggable electrical connectors ~~having connectors coupled to signal traces~~ at an opposite end; and,

a module cage mounted on a host printed circuit board of a system chassis ~~to couple to the fiber optic module~~, the module cage having a housing with an open end to accept the fiber optic module, an electrical connector for receiving the pluggable electrical receiver of the fiber optic module's printed circuit board, and one or more guide slots on sides of

an interior surface for slideably receiving the guide rails during insertion and removal of the pluggable electrical connector into and from the electrical connector of the module cage;

wherein the one or more guide rails shunt electromagnetic fields from the electromagnetic interference shield, through the cage slots to a ground of the system chassis ~~of the fiber optic module to slideably couple into the one or more guide slots of the module cage to electrically couple thereto and the one or more guide rails of the fiber optic module to slideably couple out of the one or more guide slots of the module cage to electrically decouple therefrom~~.

20. (Canceled)

21. (Original) The fiber optic system of claim 19, further comprising:

a lock mechanism, the lock mechanism having

a rocker arm with a hook to couple to a guide rail of the fiber optic module to lock it in place, and

a cam to couple to a cutout of a sliding arm and decouple the hook of the rocker arm from the guide rail of the fiber optic module.

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22. (Previously Presented) The fiber optic system of claim 19, further comprising:

an ejection mechanism, the ejection mechanism having

a sliding arm having a first end and a second end, the sliding arm to slide in response to a force at the first end, and

a lever arm with a cradle at a pivoting end, the cradle to couple to an end of the printed circuit board of the fiber optic module to push out and eject the fiber optic module, an opposite end of the lever arm coupled to the sliding arm to cause the lever arm to pivot about the pivoting end and eject the fiber optic module in response to the force at the first end of the sliding arm

23. (Previously Presented) The fiber optic system of claim 19, wherein the module cage further has one or more tabs to electrically couple the one or more guide slots to the ground plane of the host chassis ground.

24. (Previously Presented) The fiber optic system of claim 19, wherein each of the one or more guide slots of the module cage has a flared opening to more easily accept the one or more guide rails of the fiber optic module.

25. (Previously Presented) The fiber optic system of claim 19, wherein the module cage is formed of a conductive material to provide another electromagnetic shield.

26. (Previously Presented) The fiber optic system of claim 19, wherein the fiber optic module is a fiber optic transmitter and the fiber optic transmitter has a processor to separately monitor the output optical power and adjust the transmitter of each communication channel in response to the measured output optical power in each respectively.

27. (Previously Presented) The fiber optic system of claim 19, wherein said fiber optic module and said module cage conform to a form factor of a Gigabit Interface Converter (GBIC) package.

28. (Previously Presented) The fiber optic system of claim 27, wherein said fiber optic receptacles are LC receptacles.

29.-36. (Canceled)

37. (Previously Presented) The fiber optic system of claim 19, further comprising:

a lock mechanism coupled to the module cage, the lock mechanism having

a rocker arm with a hook to couple to one of the guide rails of the fiber optic module to hold the fiber optic module and the module cage coupled together, and

a cam to couple to a cutout of a sliding arm and decouple the hook of the rocker arm from the one of the guide rails of the fiber optic module;

and,

an ejection mechanism coupled to the module cage, the ejection mechanism including

the sliding arm having a first end, a second end, and the cutout, the sliding arm to slide in response to a force at the first end, and

a lever arm with a cradle at a pivoting end, the cradle to couple to an end of the printed circuit board of the fiber optic module to push out and eject the fiber optic module, an opposite end of the lever arm coupled to the sliding arm to cause the lever arm to pivot about the pivoting end and eject the fiber optic module in response to the force at the first end of the sliding arm.

38. (Canceled)

39. (Previously Presented) The fiber optic system of claim 27,

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wherein said plurality of fiber optic receptacles is at least four fiber optic receptacles sized to conform to the form factor of a GBIC package to provide at least four channels of communication.

40.-50. (Canceled)